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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/536,641

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Pierluigi D'Alessandro

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EXAMINER

SHAH, TANMAY K

ART UNIT

PAPER NUMBER

2611

MAIL DATE

DELIVERY MODE

12/10/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/536,641	Applicant(s) D'ALESSANDRO, PIERLUIGI	
	Examiner TANMAY k. SHAH	Art Unit 2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 August 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This communication is in response to Application No. 10/536,641 filed on 08/25/2008.

Specification

2. The specification is objected by examiner. Because of the following reasons

Content of Specification

- (a) Title of the Invention: See 37 CFR 1.72(a) and MPEP § 606. The title of the invention should be placed at the top of the first page of the specification unless the title is provided in an application data sheet. The title of the invention should be brief but technically accurate and descriptive, preferably from two to seven words may not contain more than 500 characters.
- (b) Cross-References to Related Applications: See 37 CFR 1.78 and MPEP § 201.11.
- (c) Statement Regarding Federally Sponsored Research and Development: See MPEP § 310.
- (d) The Names Of The Parties To A Joint Research Agreement: See 37 CFR 1.71(g).
- (e) Incorporation-By-Reference Of Material Submitted On a Compact Disc: The specification is required to include an incorporation-by-reference of electronic documents that are to become part of the permanent United States Patent and Trademark Office records in the file of a patent application. See 37 CFR 1.52(e) and MPEP § 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text were permitted as electronic documents on compact discs beginning on September 8, 2000.
- (f) Background of the Invention: See MPEP § 608.01(c). The specification should set forth the Background of the Invention in two parts:

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- (1) Field of the Invention: A statement of the field of art to which the invention pertains. This statement may include a paraphrasing of the applicable U.S. patent classification definitions of the subject matter of the claimed invention. This item may also be titled "Technical Field."
- (2) Description of the Related Art including information disclosed under 37 CFR 1.97 and 37 CFR 1.98: A description of the related art known to the applicant and including, if applicable, references to specific related art and problems involved in the prior art which are solved by the applicant's invention. This item may also be titled "Background Art."
- (g) Brief Summary of the Invention: See MPEP § 608.01(d). A brief summary or general statement of the invention as set forth in 37 CFR 1.73. The summary is separate and distinct from the abstract and is directed toward the invention rather than the disclosure as a whole. The summary may point out the advantages of the invention or how it solves problems previously existent in the prior art (and preferably indicated in the Background of the Invention). In chemical cases it should point out in general terms the utility of the invention. If possible, the nature and gist of the invention or the inventive concept should be set forth. Objects of the invention should be treated briefly and only to the extent that they contribute to an understanding of the invention.
- (h) Brief Description of the Several Views of the Drawing(s): See MPEP § 608.01(f). A reference to and brief description of the drawing(s) as set forth in 37 CFR 1.74.
- (i) Detailed Description of the Invention: See MPEP § 608.01(g). A description of the preferred embodiment(s) of the invention as required in 37 CFR 1.71. The description should be as short and specific as is necessary to describe the invention adequately and accurately. Where elements or groups of elements, compounds, and processes, which are conventional and generally widely known in the field of the invention described and their exact nature or type is not necessary for an understanding and use of the invention by a person skilled in the art, they should not be described in detail. However, where particularly complicated subject matter is involved or where the elements, compounds, or processes may not be commonly or widely known in the field, the specification should refer to another patent or readily available publication which adequately describes the subject matter.

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- (j) Claim or Claims: See 37 CFR 1.75 and MPEP § 608.01(m). The claim or claims must commence on separate sheet or electronic page (37 CFR 1.52(b)(3)). Where a claim sets forth a plurality of elements or steps, each element or step of the claim should be separated by a line indentation. There may be plural indentations to further segregate subcombinations or related steps. See 37 CFR 1.75 and MPEP § 608.01(i)-(p).
- (k) Abstract of the Disclosure: See MPEP § 608.01(f). A brief narrative of the disclosure as a whole in a single paragraph of 150 words or less commencing on a separate sheet following the claims. In an international application which has entered the national stage (37 CFR 1.491(b)), the applicant need not submit an abstract commencing on a separate sheet if an abstract was published with the international application under PCT Article 21. The abstract that appears on the cover page of the pamphlet published by the International Bureau (IB) of the World Intellectual Property Organization (WIPO) is the abstract that will be used by the USPTO. See MPEP § 1893.03(e).
- (l) Sequence Listing. See 37 CFR 1.821-1.825 and MPEP §§ 2421-2431. The requirement for a sequence listing applies to all sequences disclosed in a given application, whether the sequences are claimed or not. See MPEP § 2421.02.

Response to Arguments

3. Applicant's arguments with respect to claims 1 have been considered but are moot in view of the new ground(s) of rejection.

Regarding claim 1, Applicant amends claim 1 as follows prior to symbol synchronization and for providing estimated and compensated I and Q components of an incoming I/Q modulated signal for symbol synchronization.

Applicant argues that applied reference does not teach or suggest amended claim features.

In response to above mentioned arguments applicant's In response to above-mentioned arguments, applicant's interpretation of the applied reference has been considered. However, the applied reference teaches providing estimated and compensated I and Q components of incoming I/Q modulated signal (i.e. **The system 100 also includes an I-Q compensation circuit 150 to generate compensated versions of the signals I(t) and Q(t). The following mathematical analysis is provided to gain an understanding of the signals provided by the I-Q compensation circuit 150, page 3, paragraph 39. also The apparatus comprises a correction circuit to automatically apply a correction factor to at least one of the I and Q output signals to correct the gain and/or phase error by applying a multiplication factor to the at least one of the I and Q output signals to thereby generate a corrected signal, page , paragraph 18, so it estimates it and uses correction factor to correct or compensate I and Q)**

Anderson (US 6,297,691) teaches it does I and Q demodulation prior to symbol synchronization (i.e. **Processor 20 demodulates the digital carrier signals and provides I and Q outputs to symbol synchronization circuit 22 and to interpolate circuit 24. As will be more fully explained hereinafter, the I and Q signals represent the in-phase and quadrature amplitudes of the input modulated signal, Fig. 3, col 6, line 18 - 24).**

It would have been obvious to one of the ordinary skilled in the art at the time the invention was made to combine the teachings of Ciccarelli with Anderson. One would be motivated to combine those teachings because in

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doing so it will provide compensated I and Q components and then does symbol synchronization so it will provide better accuracy.

Regarding claim 7, applicant amends claim as follows “ phase imbalance or gain imbalance before symbol synchronization: and

compensating the phase imbalance and gain imbalance on the basis or at least one first ratio such that a feed-forward scheme or feed-back scheme is established;

wherein estimated and compensated I and Q components of an incoming I/Q modulated signal are provided for symbol synchronization.

In response to above mentioned arguments Ciccarelli teaches compensating the phase imbalance and gain imbalance on the basis or at least one first ratio such that a feed-forward scheme or feed-back scheme is established (i.e. **The signals are digitized by an A-to-D converter (ADC) 134. In an exemplary embodiment, the ADC 134 may be implemented by a Delta-Sigma converter, which is known in the art. The ADC 134 is followed by a digital filter 136 to attenuate quantization noise and a DC correction circuit 138, which provides feedback to the ADC 134, also The system 100 also includes an I-Q compensation circuit 150 to generate compensated versions of the signals $I(t)$ and $Q(t)$. The following mathematical analysis is provided to gain an understanding of the signals provided by the I-Q compensation circuit 150** page 3, paragraph 38 and 39);

And also teaches wherein estimated and compensated I and Q components of an incoming I/Q modulated signal are provided for symbol synchronization (i.e. **The system 100 also includes an I-Q compensation circuit 150 to generate compensated versions of the signals I(t) and Q(t). The following mathematical analysis is provided to gain an understanding of the signals provided by the I-Q compensation circuit 150, page 3, paragraph 39. also The apparatus comprises a correction circuit to automatically apply a correction factor to at least one of the I and Q output signals to correct the gain and/or phase error by applying a multiplication factor to the at least one of the I and Q output signals to thereby generate a corrected signal, page 2, paragraph 18, so it estimates it and uses correction factor to correct or compensate I and Q).**

Anderson (US 6,297,691) teaches it does I and Q demodulation prior to symbol synchronization (i.e. **Processor 20 demodulates the digital carrier signals and provides I and Q outputs to symbol synchronization circuit 22 and to interpolate circuit 24. As will be more fully explained hereinafter, the I and Q signals represent the in-phase and quadrature amplitudes of the input modulated signal, Fig. 3, col 6, line 18 - 24).**

It would have been obvious to one of the ordinary skilled in the art at the time the invention was made to combine the teachings of Ciccarelli with Anderson. One would be motivated to combine those teachings because in doing so it will provide compensated I and Q components and then does symbol synchronization so it will provide better accuracy.

Regarding claim 11, rejected same reasons mentioned above.

Regarding claim 12, rejected same reasons mentioned above.

Regarding claim 13, rejected same reasons mentioned above.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 12 and 13 are rejected under 35 U.S.C. 102(e) as being anticipated by **Ceccarelli (US 2003/0139167)**.

Regarding claim 12, Method of iteratively compensating a phase imbalance or gain imbalance in a receiver, the receiver utilizing a QPSK modulation and a modulation scheme based on a complex scrambling code, comprising the steps of:

a) determining an error function on the basis of samples of phase compensated in-phase components and quadrature components of a revived I/Q modulated signal (i.e. I and Q, page 2, paragraph 18);

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b) filtering the error function (LPF or digital filter of Fig. 3);

c) integrating the filtered error function (i.e. mixer, page 5, paragraph 54);

d) determining a modified error function by adding the integrated and filtered error function to a product of the integrated and filtered error function and a parameter based on speed (i.e. kHz frequency) and stability (page 6, paragraph 67);

e) determining a corrected output signal of the I/Q components of the received signal on the basis of subsequent samples of phase compensated in-phase components and quadrature components of the received I/Q modulated signal and the modified error function (page 5, paragraph 71, page 6, paragraph 67); and

f) returning to step a). providing estimated and compensated I and Q components of an incoming I/Q modulated signal for symbol synchronization.(i.e. compensation of I-Q imbalance, phase/gain error, page 5, paragraph 54, page 6, paragraph 67, also i.e. The system 100 also includes an I-Q compensation circuit 150 to generate compensated versions of the signals $I(t)$ and $Q(t)$. The following mathematical analysis is provided to gain an understanding of the signals provided by the I-Q compensation circuit 150, page 3, paragraph 39. also The apparatus comprises a correction circuit to automatically apply a correction factor to at least one of the I and Q output signals to correct the gain and/or phase error by applying a multiplication factor to the at least one of the I and Q output signals to thereby generate a corrected signal, page , paragraph 18, so it estimates it and uses correction factor to correct or compensate I and Q).

Regarding claim 13, Method of iteratively compensating a phase imbalance or gain imbalance in a receiver, the receiver utilizing a QPSK modulation and a modulation scheme based on a complex scrambling code, comprising the steps of:

- a) determining an error function on the basis of squared samples of phase compensated in-phase components and quadrature components of a received I/Q modulated signal (i.e. I and Q, page 2, paragraph 18);
- b) filtering the error function (LPF or digital filter of Fig. 3);
- c) integrating the filtered error function (i.e. mixer, page 5, paragraph 54);
- d) determining a modified error function by adding the integrated and filtered error function to a product of the integrated and filtered error function and a parameter based on speed and stability (page 6, paragraph 67);
- e) determining a gain on the basis of a product of the modified error function and a factor (page 6, paragraph 67);
- f) determining a corrected output signal of the I/Q components of the received signal on the basis of subsequent samples of phase compensated in-phase components and quadrature components of the received I/Q modulated signal and the gain (page 5, paragraph 71, page 6, paragraph 67); and
- g) returning to step a). providing estimated and compensated I and Q components of an incoming I/Q modulated signal for symbol synchronization. (i.e. compensation of I-Q imbalance, phase/gain error, page 5, paragraph 54, page 6,

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paragraph 67, also i.e. The system 100 also includes an I-Q compensation circuit 150 to generate compensated versions of the signals $I(t)$ and $Q(t)$. The following mathematical analysis is provided to gain an understanding of the signals provided by the I-Q compensation circuit 150, page 3, paragraph 39. also The apparatus comprises a correction circuit to automatically apply a correction factor to at least one of the I and Q output signals to correct the gain and/or phase error by applying a multiplication factor to the at least one of the I and Q output signals to thereby generate a corrected signal, page , paragraph 18, so it estimates it and uses correction factor to correct or compensate I and Q).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1 - 4, 6 -8, 10 - 11 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Ciccarelli (US 2003/0139167)** in further view of **Anderson (US 6,297,691)**.

Regarding claim 1, Regarding claim 1, Ciccareli teaches Receiver (**i.e. receiver, Fig. 3, page 3, paragraph 32**) for estimation or compensation of phase

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imbalance or gain imbalance (i.e. **compensation of I-Q imbalance, phase/gain error, page 5, paragraph 54, page 6, paragraph 67**), the receiver utilizing a QPSK modulation and a modulation scheme based on a complex scrambling code (**page 2, paragraph 18, i.e. sequentially generates CW signals, page 6, paragraph 72**), the receiver comprising means for estimating the phase imbalance or gain imbalance and for providing estimated and compensated I and Q components of an incoming I/Q modulated signal for symbol synchronization. (i.e. **compensation of I-Q imbalance, phase/gain error, page 5, paragraph 54, page 6, paragraph 67, also i.e. The system 100 also includes an I-Q compensation circuit 150 to generate compensated versions of the signals I(t) and Q(t). The following mathematical analysis is provided to gain an understanding of the signals provided by the I-Q compensation circuit 150, page 3, paragraph 39. also The apparatus comprises a correction circuit to automatically apply a correction factor to at least one of the I and Q output signals to correct the gain and/or phase error by applying a multiplication factor to the at least one of the I and Q output signals to thereby generate a corrected signal, page , paragraph 18, so it estimates it and uses correction factor to correct or compensate I and Q**)

Anderson (US 6,297,691) teaches it does I and Q demodulation prior to symbol synchronization (i.e. **Processor 20 demodulates the digital carrier signals and provides I and Q outputs to symbol synchronization circuit 22 and to interpolate circuit 24. As will be more fully explained hereinafter,**

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the I and Q signals represent the in-phase and quadrature amplitudes of the input modulated signal, Fig. 3, col 6, line 18 - 24).

It would have been obvious to one of the ordinary skilled in the art at the time the invention was made to combine the teachings of Ciccarelli with Anderson. One would be motivated to combine those teachings because in doing so it will provide compensated I and Q components and then does symbol synchronization so it will provide better accuracy.

Regarding claim 2, Ciccarelli (US 2003/0139167) in further view of Anderson teaches claim 1.

Coccarelli further teaches wherein the means for estimating the phase imbalance or gain imbalance before synchronization comprises means for generating **at least one first ratio** selected from the group consisting of a second ratio, a third ratio and a fourth ratio; wherein second first ratio is a ratio between a cross correlation of I and Q components ($\langle Q \rangle$) of an incoming I/Q modulated signal and a mean value of a square of the I component ($\langle I, Q \rangle$); wherein the third ratio is a ratio between the cross correlation of the I and Q components and a square root of a product between a mean value of the square of the I component and a mean value of a square of the Q component ($(\langle I^2 \rangle \langle Q^2 \rangle)^{1/2}$); and wherein the fourth ratio between the mean value of the square of the Q component ($\langle Q^2 \rangle$) and the mean value of the square of the I

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($\langle I^2 \rangle$) component (i.e. the ratio of the RMS voltage of I and Q signals, page 6, paragraph 71).

Regarding claim 3, Ciccarelli (US 2003/0139167) in further view of Anderson.

Ciccarelli further teaches wherein the means for estimating the phase imbalance or gain imbalance (i.e. compensation of I-Q imbalance, phase/gain error, page 5, paragraph 54, page 6, paragraph 67) before synchronization comprises a low pass for low pass filtering the signals (i.e. LPF, 128 of Fig. 3, page 3, paragraph 41).

Regarding claim 4, there are substantially same limitations as claim 2, thus the same rejection is applicable.

Regarding claim 6, Ciccarelli (US 2003/0139167) in further view of Anderson teaches claim 1.

Ciccarelli further teaches wherein the estimation of the phase imbalance or gain imbalance is carried out iteratively (page 6, paragraph 71).

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Regarding claim 7, there are substantially same limitation as claim 1, thus the same rejection is applicable.

Regarding claim 8, there are substantially same limitations as claim 2, thus the same rejection is applicable.

Regarding claim 10, there are substantially same limitations as claim 6, thus the same rejection is applicable.

Regarding claim 11, Ciccarelli (US 2003/0139167) in further view of Anderson teaches claim 1.

Ciccarelli further, this the same rejection is applicable (**page 6, paragraph 69, page 8, claim 28**)

Regarding claim 14, The receiver according to claim 1, further comprising means for symbol synchronization which receives the estimated and compensated I and Q components and performs synchronization of the components (**i.e. compensation of I-Q imbalance, phase/gain error, page 5, paragraph 54, page 6, paragraph 67, also i.e. The system 100 also includes an I-Q compensation circuit 150 to generate compensated versions of the signals**

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I(t) and Q(t). The following mathematical analysis is provided to gain an understanding of the signals provided by the I-Q compensation circuit 150, page 3, paragraph 39. also The apparatus comprises a correction circuit to automatically apply a correction factor to at least one of the I and Q output signals to correct the gain and/or phase error by applying a multiplication factor to the at least one of the I and Q output signals to thereby generate a corrected signal, page , paragraph 18, so it estimates it and uses correction factor to correct or compensate I and Q).

Anderson (US 6,297,691) teaches it does I and Q demodulation prior to symbol synchronization (i.e. **Processor 20 demodulates the digital carrier signals and provides I and Q outputs to symbol synchronization circuit 22 and to interpolate circuit 24. As will be more fully explained hereinafter, the I and Q signals represent the in-phase and quadrature amplitudes of the input modulated signal, Fig. 3, col 6, line 18 - 24).**

It would have been obvious to one of the ordinary skilled in the art at the time the invention was made to combine the teachings of Ciccarelli with Anderson. One would be motivated to combine those teachings because in doing so it will provide compensated I and Q components and then does symbol synchronization so it will provide better accuracy.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 5, 9 rejected under 35 U.S.C. 103(a) as being unpatentable over Ciccarelli in further view of Anderson in further view of Zheng et al. (US 2004/0002323).

Regarding claim 5, Ciccarelli with Ciccarelli teaches claim 1, although it says is CDMA technology, however it does not explicitly say the receiver is a WCDMA (UMTS) receiver and feed-forward scheme or a feed-back scheme is established in the receiver.

Zheng et al. teaches that the system could be used in WCDMA (UMTS) receiver and feed-forward scheme or a feed-back scheme is established.

It would have been obvious at the time the invention was made to combine the teachings of Ciccarelli with Zheng. Because in doing so it will provide better estimate of phase and/or gain imbalance. One would be motivated to combine those teachings because it will provide better estimate of phase and/or gain imbalance by doing the process again by feeding it back to the input.

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Regarding claim 9. Ciccarelli with Anderson teaches claim 1, although it says is CDMA technology, however it does not teach that it uses a feed-forward scheme or a feed-back scheme is established in the receiver.

Zheng et al. teaches uses feed-forward scheme or a feed-back scheme is established.

It would have been obvious at the time the invention was made to combine the teachings of Ciccarelli with Zheng. Because in doing so it will provide better estimate of phase and/or gain imbalance. One would be motivated to combine those teachings because it will provide better estimate of phase and/or gain imbalance by doing the process again by feeding it back to the input.

11. Claim 15 rejected under 35 U.S.C. 103(a) as being unpatentable over Ciccarelli in further view of Anderson in further view of Zheng et al. (US 2004/0002323).

Regarding claim 15, Ciccarelli with Anderson teaches claim 14. however it does not disclose that wherein said means for synchronization comprises a Universal Mobile Telecommunications System (UMTS) synchronizer.

Zheng et al. teaches that the system could be used in WCDMA (UMTS) (**page 13, paragraph 137**).

It would have been an obvious matter of design choice to one skilled in the art at the time the invention was made to use in UMTS receiver provided by the inventor since applicant has not disclosed that this solves any

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stated problem or is anything more than hardware choice. A person of ordinary skill in the art would find obvious for the purpose of providing I and Q imbalance compensation in receiver . In re Dailey and Eilers, 149 USPQ 47 (1966) see MPEP 2144.04.

Conclusion

1. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TANMAY k. SHAH whose telephone number is (571)270-3624. The examiner can normally be reached on Mon-Thu (7:30 - 5:00).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Payne can be reached on 571-272-3024. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/T. k. S./

Examiner, Art Unit 2611

/David C. Payne/

Supervisory Patent Examiner, Art Unit 2611